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COST-CONSEQUENCE ANALYSIS OF SCREENING AND OPTIMIZED TREATMENT OF NEPHROPATHY IN HYPERTENSIVE PATIENTS WITH TYPE-2 DIABETES IN A FRENCH SETTING

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OBJECTIVES: Type-2 diabetes patients with hypertension have a high risk of developing nephropathy, with increased risks of morbidity/mortality. Screening for, and treatment of nephropathy, is currently suboptimal in France. We assessed the long-term impact of screening for nephropathy followed by optimal antihypertensive therapy in those in which nephropathy is detected in France. **METHODS:** A Markov model projected lifetime impacts of screening, identification, and appropriate treatment of nephropathy using semi-quantitative urine dipsticks in a primary care setting, followed by treatment with irbesartan 300 mg added to conventional antihypertensives in a typical cohort of hypertensive Type-2 diabetes patients. The model simulated progression from no renal disease to end-stage renal disease (ESRD). Probabilities and costs came from published sources. Cumulative incidence of ESRD, years free of ESRD, life expectancy (LE) and direct costs were projected. Second-order Monte Carlo simulation was used to account for uncertainty in multiple parameters. **RESULTS:** In a cohort of 1000 patients, screening for nephropathy followed by optimal treatment reduced cumulative incidence of ESRD from (mean ± SD) 11.0 ± 1.7% to 6.5 ± 1.1%, increased number of ESRD-free years by 524 ± 80 years, increased undiscounted LE by 361 ± 60 years, and reduced costs (discounted 3% annually) by €3,340,200 ± 799,800. Sensitivity analysis showed that screening was most beneficial in younger patients. **CONCLUSIONS:** In hypertensive type-2 diabetes patients, screening for albuminuria followed by optimal antihypertensive treatment that includes irbesartan 300 mg, is projected to lead to substantial reductions in the incidence of ESRD, improvements in ESRD-free survival and life expectancy, and overall cost savings.

PDB34

DIABETES PREVALENCE AND DIRECT MEDICAL COST ANALYSIS PER YEAR FROM 1997 TO 2001 IN TAIWAN

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OBJECTIVE: Diabetes mellitus is an important chronic disease with a growing prevalence that absorbs an ever increasing investment of resources. This study described the prevalence and the cost of diabetic care using sampling claim data from the National Health Insurance Program in Taiwan. **METHOD:** Five-year (1997~2001) random sampling claimed database were prepared by the National Health Research Institute, Taiwan, R.O.C. The database contains 200,000 individuals' longitudinal medical claim data (0.9% Taiwan population), including outpatient and inpatient care records. Patients with the ICD-9-CM code of 250 in their primary diagnosis column were used in the analysis. **RESULT:** The prevalence rate of diagnosed diabetes patients from 1997 to 2001 was 2.42%, 2.57%, 2.61%, 2.67% and 2.74%, respectively. This rate increased 12.8% in 5 years. The average total direct medical cost per patient per year increased 18%, from 10,479 NTD in 1997 to 12,811 NTD in 2001.The average number of outpatient visit increased from 7.4 in 1997 to 7.8 times in 2001. The average cost of outpatient care per patient per year increased 27%, from 7680 NTD in 1997 to 10,016 NTD in 2001. The average inpatient care cost per hospitalization increased 60%, from 29,908 NTD in 1997 to 48,071 NTD in 2001. Finally, the average total drug cost increased 31%, from 5487 NTD in 1997 to 7209 NTD in 2001. All costs did not adjust for inflation. **CONCLUSION:** The direct medical cost for diabetes care increased rapidly in these 5 years, the rate increased faster then the prevalence rate. The rate of drug cost increased more then that of the total medical cost. Although the representative of that sampling data needs verification, the preliminary data indicate that outpatient expenditure increased significantly. The appropriateness of resource utilization and quality of diabetes care need more stringent management.

PDB35

THE COST OF DIABETES MELLITUS IN SPAIN

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OBJECTIVE: To estimate the cost of diabetes mellitus (DM) in Spain by reviewing all available DM cost data. **METHODS:** Outstanding articles and unpublished data were identified through searches of PubMed, Spanish Medical Index, Spanish databases for doctoral thesis, Ministry of Health, Carlos III Health Institute, Spanish Health Technology Assessment Agencies, SAMFYC diabetes group, Spanish Federation of Diabetes Education Societies, and other DM sources from 1966 to November 2004. All studies with outstanding information on direct or indirect costs of DM diagnosis, treatment or complications were included (cost estimates in € of 2004). **RESULTS:** In total, 32 cost-of-illness (COI) studies published between 1982 and 2004 met the inclusion criteria (16.354 DM patients), 23 of them were performed with the prevalence method, 1 with the incidence method and 6 were pharmacoeconomic analyses. Total annual costs of DM in Spain would range between €685 and €2.771 million (1.6–6.4% of the Spanish public health expenditure). However, those results could underestimate the real DM cost (according to CODE-2 study, the Type-2 DM cost in Spain would be around 2.317 million € per year). The annual average cost per patient with DM would range between 1.627 and €3.982 for DM type-1 and €1.049–€5.091 for DM Type-2. The cost of hospital admissions, primary care visits and antidiabetic treatments would be 36–58%, 7–14% and 11–13% of the total cost, respectively. The indirect costs would be 28–43% of total DM costs. DM complications costs: serious hypoglycemia (€3.469), hyperglycemia (€3.357), infections (€2.703), ketoacidosis (€2.633), stroke (€4.091), ischemic cardiac disease (€3.675), neuropathy (€3.540), nephropathy (€3.525) and retinopathy (€2.109). **CONCLUSIONS:** The variability in the costs estimates was due to the differences of the studies design. To estimate the real cost of DM, a well designed COI prospective study is needed.

PDB36

COST OF TYPE-2 DIABETES MELLITUS IN HONG KONG CHINESE

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OBJECTIVES: Despite the recent increase in incidence and prevalence of Type-2 diabetes mellitus (T2DM) in Hong Kong, the economic impact of the disease has never been investigated. This study aims to estimate the total economic burden of a group of T2DM patients attending a public hospital in Hong Kong

using a prevalence-based cost-of-illness approach. **METHODS:** A retrospective cohort observational study was conducted. The direct medical costs incurred at the public hospital were collected from a hospital electronic database. The other costs were estimated using a standard Chinese questionnaire. The figures obtained were extrapolated to estimate the total burden for the whole T2DM population in Hong Kong. The study was conducted from the perspective of a public hospital. **RESULTS:** Two hundred and four patients with T2DM were randomly selected to join this study and 147 were subsequently enrolled. Annual total direct medical cost per patient was US$1492 in which the government was shouldering 90.6%, while the patients only paid for the remaining 9.4%. Among these, specialist outpatient clinic visit costs and inpatient costs were the major cost drivers, which contributed up to 39.6% and 43.0% of the overall cost, respectively. The direct medical cost jumped dramatically, by 1.3 times, if the patient had complications. The total government direct medical cost for those without complication was US$1254/patient/year, which would jump to US$1692 for patients developing both microvascular and macrovascular complications. T2DM was found to have significant impact to the local health care budget. It contributed to about 5.0% of the total Hong Kong health care expenditure. **CONCLUSIONS:** This study confirmed T2DM and its complications pose a significant burden on the health care budget of Hong Kong. Slowing the progression of the disease to the more advanced and costly states should be cost saving.

PDB37

COSTS OF STAYS OF CARDIOVASCULAR EVENTS OF DIABETIC PATIENTS IN THE FRENCH HOSPITALS

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OBJECTIVE: To estimate the French hospital extra costs of cardiovascular events (CVE) occurring in diabetic and non diabetic patients. **METHODS:** Hospital stays were extracted from the 2003 national Diagnosis Related Group (DRG) including the whole French stays (around 18 million records). Stays were selected on the ICD-10 and/or procedures codes related to the following events: stroke, myocardial infarction, unstable angina, and coronary revascularisation. Diabetic patients were picked out using secondary diagnosis related to diabetes mellitus (type I and II). The level of resource consumption and average length of stay were analyzed in both diabetic and non diabetic groups. For the economic analysis, an adjustment method based on national DRG costs (public and private hospitals) was used to take into account extra length of stay of diabetic patients compared with average DRG length of stay. **RESULTS:** Average length of stay of diabetics was significantly longer than non diabetics (stroke: 2.45 days, myocardial infarction: +1.48 days, unstable angina: +1.25 days, revascularisation: 2.82 days; $p < 0.001$ for each). The mean number of medical procedures recorded by stay was higher in the diabetic group (stroke: +0.51; myocardial infarction: +0.80, unstable angina: +0.92, revascularisation: +1.91; $p < 0.001$ for each) and diabetic patients had more Intensive Care Unit transfer for myocardial infarction and unstable angina (odd ratio diabetic versus non diabetic: 1.7 and 1.3; $p < 0.001$). Adjusted hospitalization costs of events for diabetic patients were the following: stroke (non fatal event): €5703, myocardial infarction (non fatal event): €4721, unstable angina: €4147, coronary revascularisation: €11,679. The overcosts of diabetic patients for these events compared with average DRG cost were respectively +23.9%, +10.4%, +6.1% and +9.1%. **CONCLUSION:** Diabetic patients with CVE required higher medical consumptions than non diabetic during hospital management. Extra costs associated with diabetes were estimated and can be used in cost-effectiveness studies.

PDB38

ANALYSIS OF THE COST OF DIABETES TREATMENT IN BULGARIA

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OBJECTIVES: Cost study of diabetes therapy was conducted at national level in 1997 but the introduction of health insurance system and a lot of new medicines changed treatment patterns as well the cost of therapy. The goal of this study is to analyse the cost of diabetes therapy from the National Health Insurance Fund (NHIF) point of view and to compare prescribing practice with the previous study. **METHODS:** Information by the NHIF electronic data base was collected at national level and representative sample of 3410 and 2440 prescriptions for type-1 and type-2 diabetic patients was analyzed. The observed patients were also systematized for the available complications and their treatment cost was calculated on the basis of NHIF tariffs. Manufacturers' information for the insulin market was collected and compared with the prescribing information. **RESULTS:** The number of diabetic patients increased since 1997 from 150,000 to 225,000 and patients on insulin therapy account for 35%. The cost of the ambulatory treatment with peroral antidiabetics account for €800,000 while expenditures for insulin are €32 million. The metformin was prescribed in 43% and glibenclamid in 25% of prescriptions. It was revealed substantial growth in the total insulin market from 610 MU in 1997 to 969 MU sold in 2004 with prevailing prescribing of insulin mixtures in 59%. Micro and macro vascular complications prevail in 97% of the patients and account for 59% of expenditures paid for hospitalization and 20% of ambulatory expenditures. Expenditures for insulin account for 18% of the cost of diabetes treatment while per oral antidiabetics for less than 8%. **CONCLUSION:** The cost of insulin treatment of one patient is close to cost reported by similar European studies but Bulgaria delay with the introduction of insulin analogues and it could affect the future complications therapy.

PDB39

EVALUATION OF THE COST-UTILITY OF INSULIN DETEMIR COMPARED TO INSULIN GLARGINE, BOTH IN COMBINATION WITH INSULIN ASPART IN TYPE-1 DIABETES IN GERMANY AND AUSTRIA

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OBJECTIVES: Intensive insulin treatment is associated with an increased risk of hypoglycemic events in type-1 diabetes. A recent 26-week randomized clinical trial demonstrated that basal/bolus treatment of type-1 diabetic patients with insulin detemir + insulin aspart (IDet/IAsp), compared to insulin glargine + insulin aspart (IGlar/IAsp), led to a 72% lower risk of major hypoglycemic events ($p < 0.05$). **METHODS:** A validated model was used to project long-term complications, quality-adjusted life expectancy, long-term direct and indirect costs, and incremental cost-utility ratios (ICURs) for IDet/IAsp versus IGlar/IAsp in Austria and Germany. Markov modeling was used to describe the incidence and progression of complications (cardiovascular disease, neuropathy, renal and eye disease). Probabilities of com-